(No Model.)

C. SAHLER.

CUPOLA SMELTING FURNACE.

No. 445,381. Patented Jan. 27, 1891.

Fig. 1.

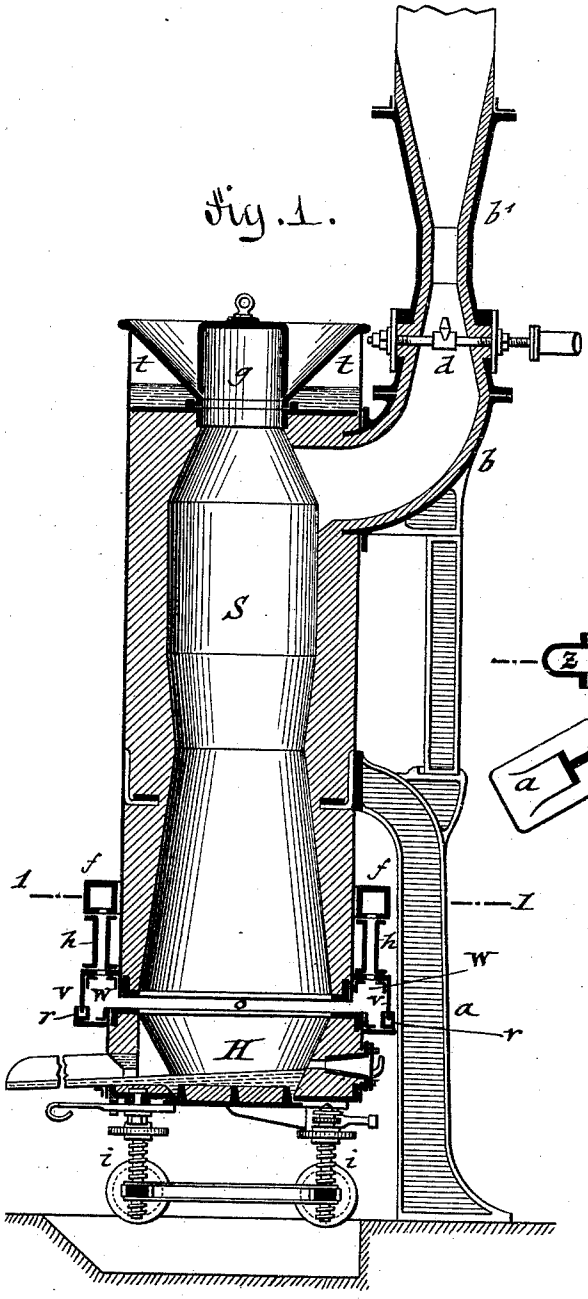
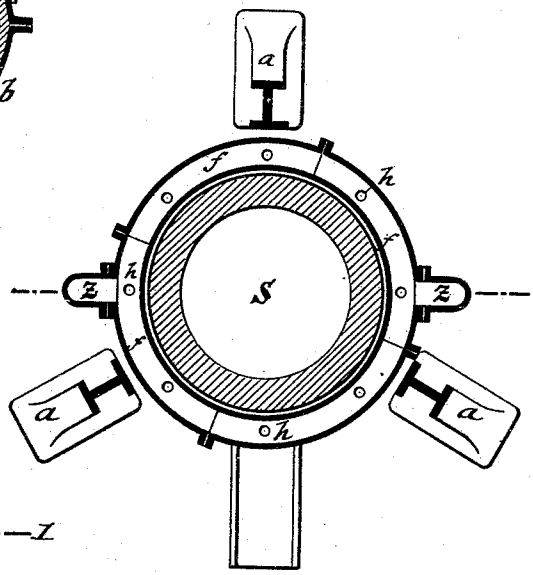


Fig. 2.



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CUPOLA SMELTING-FURNACE.

SPECIFICATION forming part of Letters Patent No. 445,381, dated January 27, 1891.

Application filed December 13, 1889. Serial No. 333,687. (No model.)

To all whom it may concern:

Be it known that I, CARL SAHLER, a subject of the King of Prussia, Germany, residing at Cologne, Prussia, Germany, have invented certain new and useful Improvements in Cupola Smelting-Furnaces, of which the following is a specification.

This invention relates to an improved cupola smelting-furnace of that class in which a movable and vertically-adjustable hearth is arranged below the shaft of the furnace for carrying off the melted material collected in said hearth; and the invention consists of a cupola smelting-furnace which comprises a shaft having an open lower end, a vertically-adjustable hearth below said shaft and separated therefrom by an annular air-admission channel, and an annular air-supply box extending around the adjoining ends of the shaft and hearth and formed of two sections, the lower section of which is attached to the hearth and provided with a trough, while the upper section is attached to the shaft, having an outer wall extending loosely into the trough of the lower section, so as to permit the simultaneous adjustment of the air-supply box and of the air-admission channel.

In the accompanying drawings, Figure 1 represents a vertical central section of my improved cupola smelting-furnace, and Fig. 2 is a horizontal section of the same on line 1 1, Fig. 1.

Similar letters of reference indicate corresponding parts.

In the drawings, S represents the shaft of my improved cupola smelting-furnace, which is supported by three strong standards *a a*, as shown in Fig. 2. Below the open lower end of the shaft S is arranged the portable and vertically-adjustable hearth of the same. Between the lower end of the shaft and the upper edge of the hearth is formed an annular air-admission channel *o*, the size of which may be readily adjusted by raising or lowering the hearth relatively to the lower end of the shaft S. The shaft S is connected at its upper end with a curved channel *b*, having a contracted portion *b'*, which forms, with a steam-supply nozzle *d*, an ejector, by which the air is drawn through the material in the shaft S. The channel *b'* is connected with a chimney, made of brick or other suitable material. The top of the shaft S is closed by means of a funnel *t* and an inverted bell *g* in the usual manner.

The charging of the shaft S is accomplished by the lifting of the bell *g*, so that the material can pass through the funnel *t* and the top opening of the shaft into the latter. By the action of the ejector a suction is created in the shaft, by which atmospheric air is drawn through the annular channel *o* at the lower end of the shaft, the air serving for producing the combustion of the fuel and accelerating the melting process. In smelting small grain or pulverized substances the suction created by the ejector may not be strong enough to draw air through the dense layers of the material in the lower part or "melting-zone" of the shaft, so that the proper degree of heat required for the smelting of the metal cannot be produced. It is therefore necessary to force an additional blast of air through the annular opening *o* from the outside. For this purpose an annular air-box *f* is arranged around the lower part of the shaft, to which box compressed air is conducted by two supply-trunks *z*. The air passes from the annular box *f* through a number of vertical connecting-tubes *h* into a sectional and adjustable annular air-supply box W, which is arranged around the annular air-admission channel *o*. This annular air-box is made of two sections—a lower section, which is attached to the hearth H, and an upper section, which is connected to the lower end of the shaft C. These sections are necessary for permitting the adjustment of the size of the air-supply box W when the size of the air-admission channel *o* is increased or decreased. The outer wall of the lower section of the air-box W is provided with a trough *r*, into which the outer wall *v* of the upper section is inserted. The space between the walls of the trough *r* and the wall *v* is tightly filled with sand. When the hearth H is screwed higher or lower by the adjusting-screws *i* below the same, the U-shaped trough *r* of the lower section of the air-supply box W is adjusted higher or lower on the outer wall *v* of the upper section of said air-box, so that the size of the air-box is thus diminished or enlarged, according as the size of the annular air-transmission channel

o is decreased or increased, so that consequently during the working of the furnace a smaller or larger quantity of air may be permitted to pass into the same for accelerating combustion and producing the smelting of the metal.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. The combination, with a shaft having an open lower end, of a vertically-adjustable hearth below the same, separated from said shaft by an annular air-admission channel, and an annular air-supply box extending around the adjoining ends of the shaft and hearth and formed of two sections, the lower section of which is attached to the hearth and provided with a trough, while the upper section is attached to the shaft and has an outer wall extending loosely into the trough of the lower section, so as to permit the simultaneous adjustment of the air-supply box and of the air-admission channel, substantially as set forth.

2. The combination, with a shaft S, open at the lower end, of a vertically-adjustable hearth H below the same, separated from said shaft by an annular air-admission channel *o*, an annular air-supply box *f*, extending around the lower part of the shaft S, vertical connecting-pipes *h* and a sectional annular air-supply box W, extending around the air-admission channel *o* and formed of a lower section attached to the hearth and provided with a sand-filled trough *r*, and of an upper section attached to the shaft and having an outer wall *v* extending into the trough, substantially as set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

CARL SAHLER.

Witnesses:
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GUSTAVE OELRICHS.